A combination of the TDM with the SRQAM of the present invention has been described in the above. However, the SRQAM of the present invention can be combined also with any of the FDM, CDMA and frequency dispersal communications systems.

What is claimed is:

1. A signal transmission and reception apparatus for transmitting and receiving an n-level VSB signal, the apparatus comprising a transmitter and a receiver;

said transmitter comprising:

a compression means for compressing an input video signal to a digital video compression signal;

an error correction encoding means for adding an error correction code to the digital video compression signal to produce an error correction coded signal;

a modulation means for modulating the error correction coded signal to an n-level VSB modulation signal, said modulation means comprising a means for allocating code points along a uniaxial modulation coordinate system, and a filter means having a plurality of coefficients which are a series of impulse responses defined by plotting timebase responses to the VSB modulation signal along the in-phase axis and its orthogonal axis for filtering a series of said code points allocated along the uniaxial modulation coordinate system; and

a transmission means for transmitting the modulation signal, and

said receiver comprising:

a means for receiving a transmitted n-level VSB modulation signal;

a demodulation means for demodulating the received n-level VSB modulation signal into a digital reception signal;

an error correction means for error correcting the digital reception signal to obtain an error-corrected digital signal; and

an expanding means for expanding the error-corrected digital signal to obtain a video output signal.

2. A transmission and reception apparatus according to claim 1, wherein the error correction means comprises a trellis decoder.

3. A transmission and reception apparatus according to claim 2, wherein the trellis decoder is associated with a plurality of memories which each holds a number of selectable correct codes.

4. A transmission and reception apparatus according to claim 1, wherein the digital reception signal is divided into a high priority signal and a low priority signal, and wherein said error correction means comprises a high code gain first error correction means and a low code gain second error correction means, said first error correction means correcting the high priority signal.

5. A transmission and reception apparatus according to claim 4, wherein the high priority signal carries the address data for all data.

6. A transmission and reception apparatus according to claim 4, wherein the first error correction means comprises a trellis decoder.

7. A signal transmission and reception apparatus according to claim 1, further comprising a band path filtering means for filtering the n-level VSB modulation signal before being transmitted.

8. A signal transmission and reception apparatus for transmitting an n-level VSB signal, comprising:

a compression means for compressing an input video signal into a digital video compression signal;

an error correction encoding means for adding an error correction code to the digital video compression signal to produce an error correction coded signal;

a modulation means for modulating the error correction coded signal to an n-level VSB modulation signal, said modulation means comprising a means for allocating code points along a uniaxial modulation coordinate system, and a filter means having a plurality of coefficients which are a series of impulse responses defined by plotting timebase responses to the VSB modulation signal along the in-phase axis and its orthogonal axis for filtering a series of said code points allocated along the uniaxial modulation coordinate system; and

a transmission means for transmitting the modulation signal.

9. A signal transmission apparatus according to claim 8, further comprising a band path filtering means for filtering the n-level VSB modulation signal before being transmitted.

10. A signal receiving apparatus comprising:

a tuner for receiving a transmission signal containing a digital modulation signal and an analog modulation signal and for selecting the digital modulation signal using a local oscillation signal;

an interference detecting means for detecting interference caused by the analog modulation signal from the digital modulation signal selected by the tuner;

a notch filter means responsive to the interference detected by the interference detecting means for removing a carrier of the analog modulation signal in a same frequency band as a frequency band of the digital modulation signal;

an error ratio calculating means for calculating a bit error ratio of an output of the notch filter means; and

an automatic frequency correcting means for changing a frequency of the local oscillation signal of the tuner according to a level of the interference detected by the interference detecting means and the bit error ratio calculated by the error ratio calculating means to compensate for a frequency offset of the carrier of the analog modulated signal.

11. A signal receiving apparatus according to claim 10, wherein the digital modulation signal is an n-level VSB modulation signal.

12. A signal receiving apparatus comprising:

a tuner for receiving a transmission signal containing at least one of a VSB modulated signal and a QAM modulated signal and for selecting one of the VSB modulated signal and the QAM modulated signal to obtain a selected signal;

an analog-to-digital converter for converting the selected signal into a series of digital codes;

a transversal filter provided on an orthogonal axis for suppressing a transmission distortion of the series of digital codes with respect to both orthogonal axes to obtain a series of filtered digital codes allocated on the orthogonal axes;

a carrier recovery means for phase-compensating a carrier of the filtered digital codes allocated on the orthogonal axis outputted from the transversal filter; and

a control means for producing a control signal to extract detected codes at equal time intervals from the VSB modulated signal;

a clock reproducing means for phase synchronizing entire codes of the QAM modulated signal when the selected signal is the QAM modulated signal and for phase synchronizing codes of the VSB modulated signal intermittently at predetermined intervals when the selected signal is the VSB modulated signal; and

a decoding means for decoding an output of the carrier recovery means.

corresponding to up-to-date technological achievements. Particularly, the energy for signal transmission will surely be increased on any satellite. Each TV station should provide a compatible service for guaranteeing TV program signal reception to any type receivers ranging from today's common ones to future advanced ones. The signal transmission system of the present invention can provide a compatible broadcast service of both the existing NTSC and HDTV systems and also, ensure a future extension to match mass [date] data transmission.

Please amend the paragraph beginning in Column 82, line 38 as follows:

The present invention concerns much on the frequency utilization than the energy utilization. The signal receiving sensitivity of each receiver is arranged [different] differently depending on a signal state level to be received so that the transmitting power of a transmitter needs not be increased largely. Hence, existing satellites which offer a small energy for reception and transmission of a signal can best be used with the system of the present invention. The system is also arranged for performing the same standards corresponding to an increase in the transmission energy in the future and offering the compatibility between old and new type receivers. In addition, the present invention will be more advantageous for use with the satellite broadcast standards.

IN THE CLAIMS:

Please cancel claims 18-23 without prejudice or disclaimer of the subject matter therein, and add new claims 24-29 as follows.

13 24. A signal transmission apparatus for transmitting a first data stream and a second data stream, comprising:

- a modulator operable to assign each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

D1 cont

- a transmitter operable to transmit the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data.

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25. A signal receiving apparatus, comprising:

- a receiver operable to receive a transmitted signal to produce a received signal, the received signal having information of a first data steam and a second data stream, wherein each data stream is assigned to a respective constellation in a vector space diagram, the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and wherein the first data stream has a synchronization data and data for demodulation for demodulating the received signal corresponding to the second data stream, the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data; and

D1 cont

- a demodulator operable to demodulate the received signal to produce the first data stream and the second data stream, wherein said demodulator produces the second data stream according to the data for demodulation.

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26. A signal transmission system comprising a signal transmission apparatus and a signal receiving apparatus,

said signal transmission apparatus for transmitting a first data stream and a second data stream, comprising:

- a modulator operable to assign each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals, wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

- a transmitter operable to transmit the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals

corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data;

said signal receiving apparatus, comprising:

- a receiver operable to receive a transmitted signal to produce a received signal; and

- a demodulator operable to demodulate the received signal to produce the first data stream and the second data stream, wherein said demodulator produces the second data stream according to the data for demodulation.

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~~27.~~ A signal transmission method for transmitting a first data stream and a second data stream, comprising:

- assigning each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

D1 Cont

- transmitting the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data.

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~~28.~~ A signal receiving method comprising:

- receiving a transmitted signal to produce a received signal, the received signal having information of a first data stream and a second data stream, wherein each data stream is assigned to a respective constellation in a vector space diagram, the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and wherein the first data stream has a synchronization data and data for demodulation for demodulating the received signal corresponding to the second data stream, the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data; and

- demodulating the received signal to produce the first data stream and the second data stream, wherein said demodulating produces the second data stream according to the data for demodulation.

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~~29.~~ A signal transmission and receiving method comprising a signal transmission method and a signal receiving method,

said signal transmission method for transmitting a first data stream and a second data stream, comprising:

- assigning each of the first and second data streams to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream, and

D1 Cont'd

- transmitting the modulated signals, wherein the first data stream has a synchronization data and data for demodulation for demodulating the modulated signals corresponding to the second data stream, and wherein the synchronization data is located at the beginning of the first data stream, and the data for demodulation follows the synchronization data;

said signal receiving method, comprising:

- receiving a transmitted signal to produce a received signal,

- demodulating the received signal to produce the first data stream and the second data stream, wherein said demodulating produces the second data stream according to the data for demodulation.